

TA-3650

*UK Model
AEP Model*



INTEGRATED STEREO AMPLIFIER

SPECIFICATIONS

GENERAL

Power Requirements: 110, 127, 220 or 240 V ac adjustable, 50/60 Hz

Power Consumption: 320 W (UK model)
540 W (AEP model)

Dimensions: Approx.
460 (w) x 170 (h) x 325 (d) mm
18 1/8 (w) x 6 5/8 (h) x 12 7/8 (d) inches
Including projecting parts and controls

Weight: Approx. 12.0 kg, 26 lb 8 oz (net)
Approx. 14.5 kg, 32 lb (with shipping carton)

POWER AMPLIFIER SECTION

Continuous RMS Power Output: Both channels driven simultaneously
(rated output)
(Less than 0.1 % harmonic distortion)
At 20 – 20,000 Hz
55 + 55 W (8 Ω)
At 1 kHz
60 + 60 W (8 Ω)
70 + 70 W (4 Ω) (AEP model)
According to DIN 45500
55 + 55 W (8 Ω)

Dynamic Power Output: 170 W (8 Ω)
(IHF constant power supply method)
200 W (4 Ω) (AEP model)

Power Bandwidth: 5 – 40,000 Hz, IHF

Damping Factor: 35 (8 Ω , at 1 kHz)

Harmonic Distortion: Less than 0.1 % at rated output
Less than 0.03 % at 1 W output

IM Distortion: Less than 0.1 % at rated output
(60 Hz : 7 kHz = 4 : 1)
Less than 0.03 % at 1 W output

Frequency Response: 3 – 100,000 Hz ± 2 dB
(at 1 W output)

S/N Ratio: Greater than 110 dB, short-circuited input

Residual Noise: Less than 0.008 μ W (8 Ω)

Inputs: POWER IN
Sensitivity 1.0V (for rated output)
Impedance 47 k Ω

Outputs: SPEAKER A, B
Accept speakers of 8 Ω or more.
(UK model)
Accept speakers of 4 – 16 Ω
(AEP model)

HEADPHONES
Accepts low and high impedance headphones

— continues to page 2 —

SONY®

SERVICE MANUAL

PREAMPLIFIER SECTION

Inputs:

	Sensitivity	Impedance	Maximum Input Capability (THD 0.1 %)	S/N (weighting network, input level)
PHONO 1, 2	2.5 mV (-50 dB)	50 k Ω	210 mV	70 dB (B. 2.5 mV)
TUNER AUX TAPE 1, 2 REC/PB	150 mV (-14.5 dB)	100 k Ω		90 dB (A. 150 mV)

Outputs:

	Output Level	Impedance
REC OUT 1, 2	150 mV	10 k Ω
REC/PB	17 mV	82 k Ω
PRE OUT	1.0 V	1.8 k Ω

Harmonic Distortion: Less than 0.05 % at rated output

IM Distortion: Less than 0.05 % at rated output
(60 Hz : 7 kHz = 4 : 1)

Frequency Response: PHONO 1, 2 RIAA equalization curve ± 0.5 dB
 TUNER
 AUX
 TAPE 1, 2 } 10 Hz - 100 kHz ± 0 dB
 REC/PB }
 (input)

Tone Controls: BASS
 ± 10 dB at 50 Hz (TURNOVER FREQ 250 Hz)
 ± 10 dB at 100 Hz (TURNOVER FREQ 500 Hz)
 TREBLE
 ± 10 dB at 10 kHz (TURNOVER FREQ 2.5 kHz)
 ± 10 dB at 20 kHz (TURNOVER FREQ 5 kHz)

Filters: LOW 6 dB/oct. below 30 Hz
 HIGH 6 dB/oct. above 10 kHz

Loudness: +10 dB at 50 Hz, +3 dB at 10 kHz
 (att. 30 dB)

Presence: +2.5 dB at 1 kHz
 (att. 30 dB)

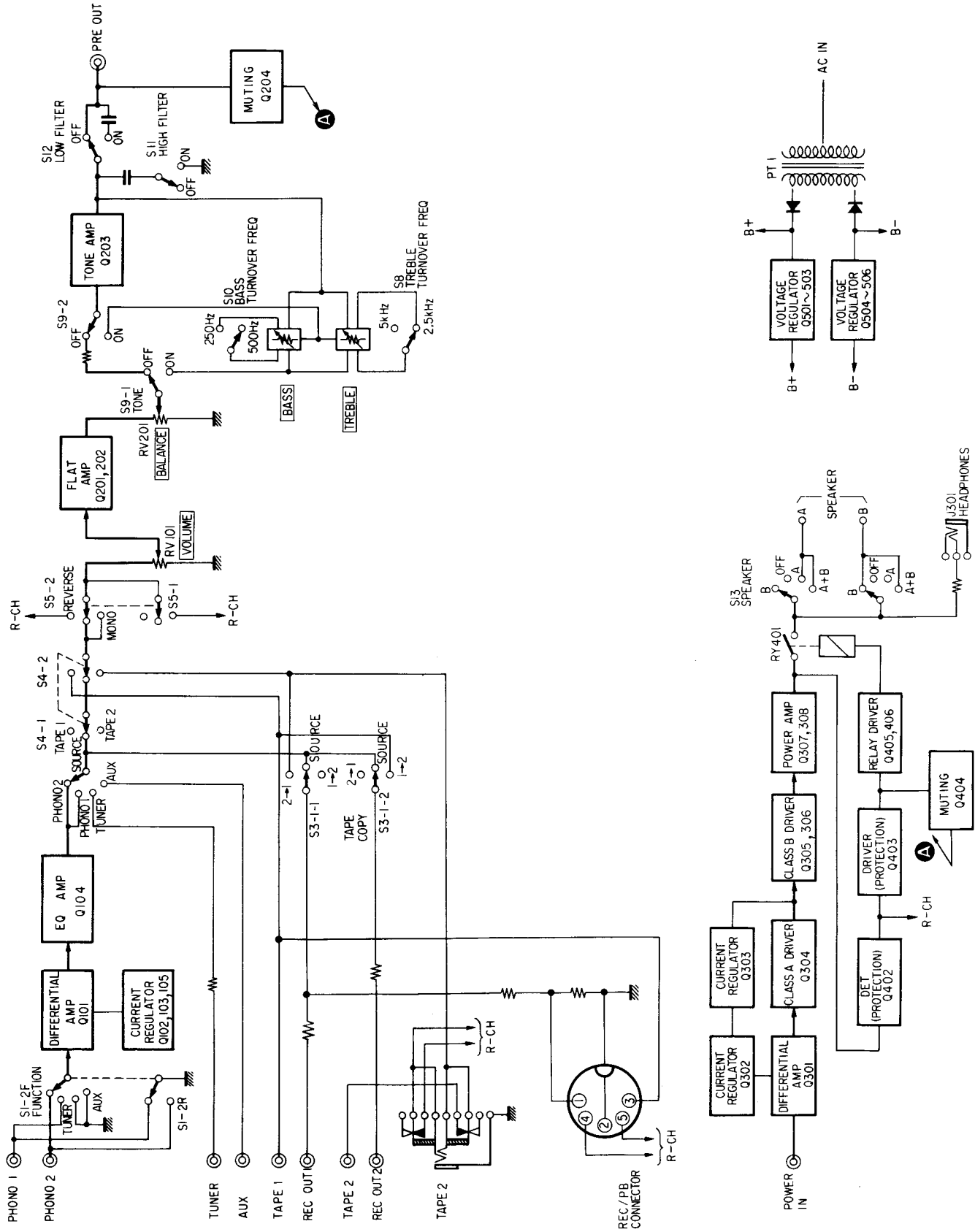
Residual Noise: Less than 0.15 μ V
 (VOLUME minimum; TONE,
 FILTERS, LOUDNESS, and
 PRESENCE off)

IDENTIFICATION OF SET

TA-3650 is classified by the specification label as shown below.

	Specification Label
UK Model	<div><div>SONY®</div><div>INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 320W SERIAL NO. MADE IN JAPAN</div></div>
AEP Model	<div><div>SONY®</div><div>INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 540W SERIAL NO. MADE IN JAPAN</div></div>

BLOCK DIAGRAM



SECTION 2

DISASSEMBLY

SIDE BOARD and TOP COVER REMOVAL

1 $\pm BW4 \times 22$
(at both side)

FRONT PANEL REMOVAL

(side view)

knobs ①

front panel

③ BV 3x6
(at both side)

② BV 3x6

front panel (top view)

POWER AMP BOARD REMOVAL

REC/PB connector board

BV 3x6 ②

power supply board

LOUDNESS board

flat amp board

① BV 3x6

③ two claws

power amp board

tape control board

EQ amp board

HOW TO RAISE THE CIRCUIT BOARDS

(FLAT AMP, EQ AMP, TAPE CONTROL and LOUDNESS BOARDS)

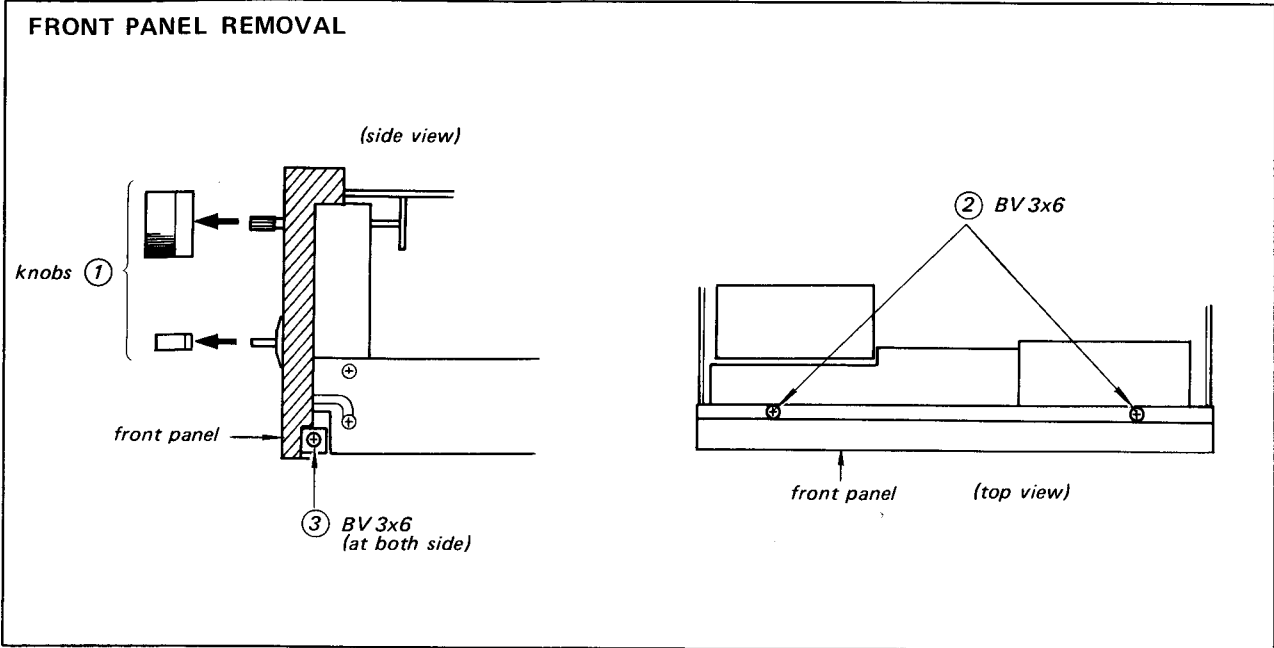
4. Tilt the front panel section

1. Remove a screw
(BV 3x6).

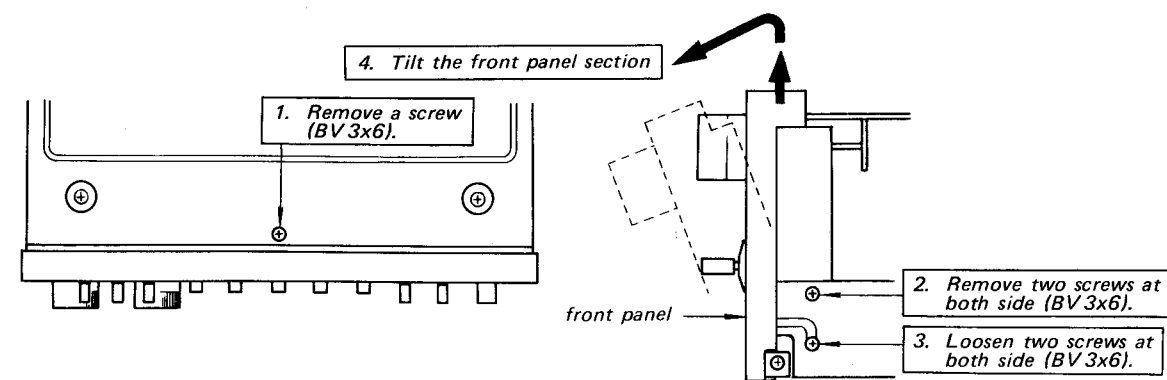
front panel

2. Remove two screws at
both side (BV 3x6).

3. Loosen two screws at
both side (BV 3x6).

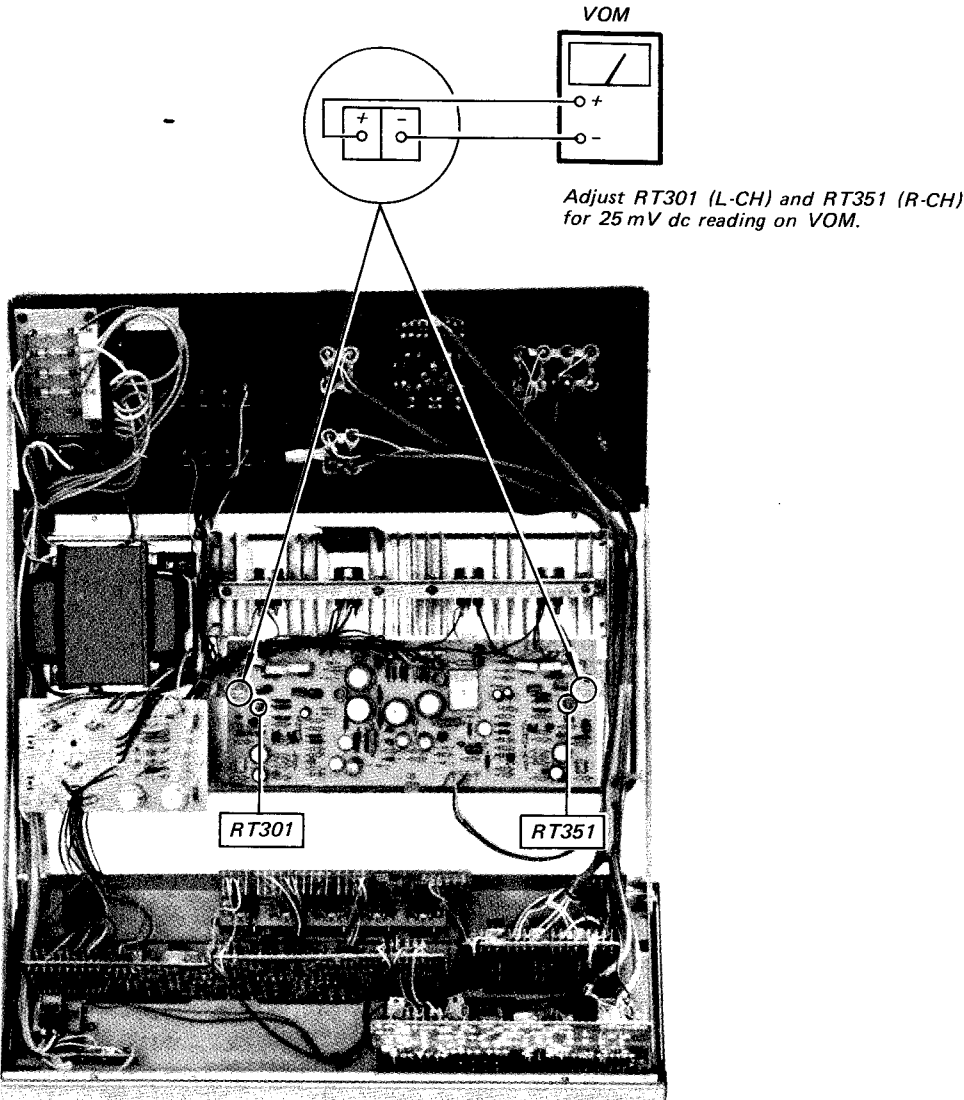


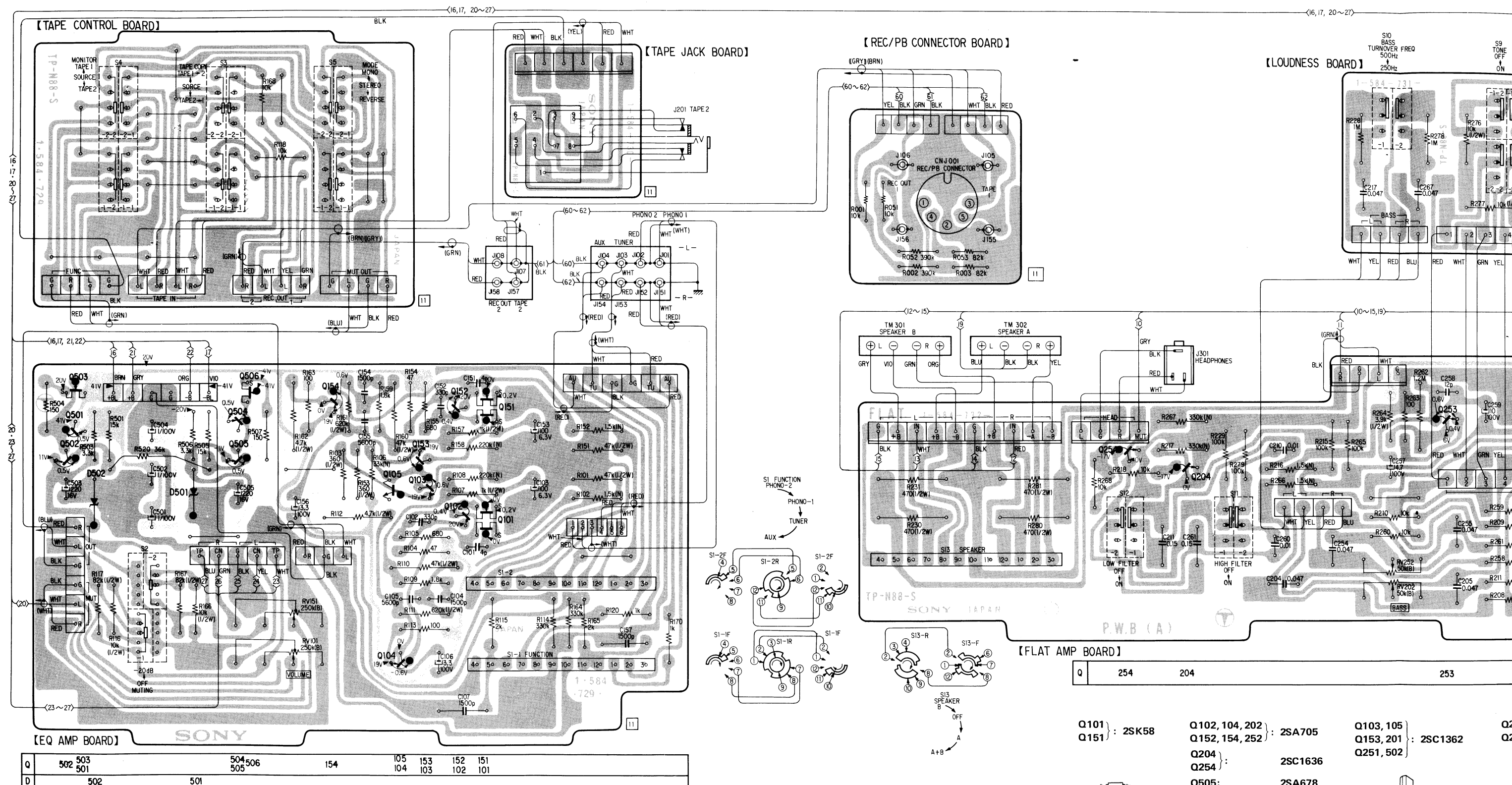
**HOW TO RAISE THE CIRCUIT BOARDS
(FLAT AMP, EQ AMP, TAPE CONTROL and LOUDNESS BOARDS)**

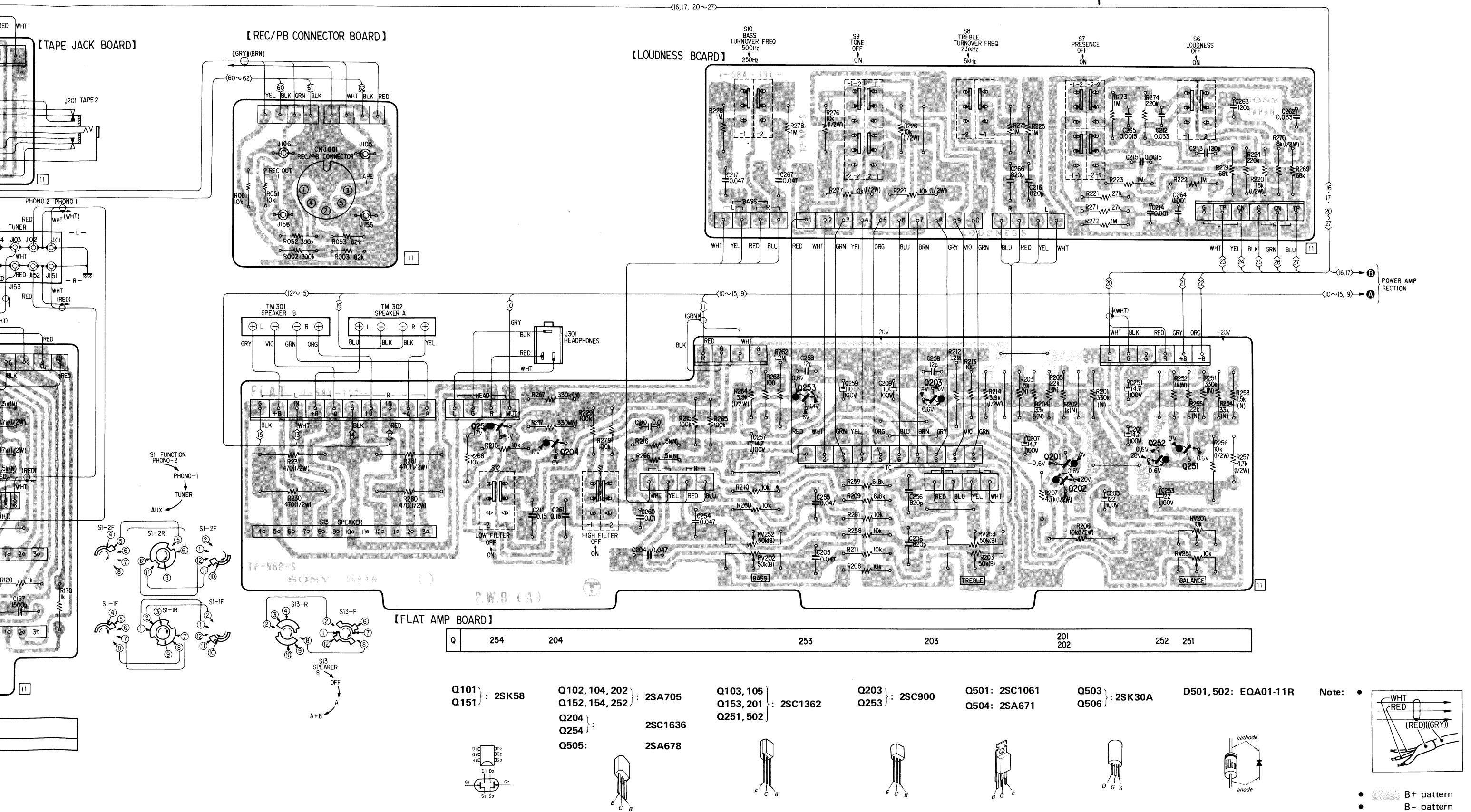


**SECTION 3
ADJUSTMENT**

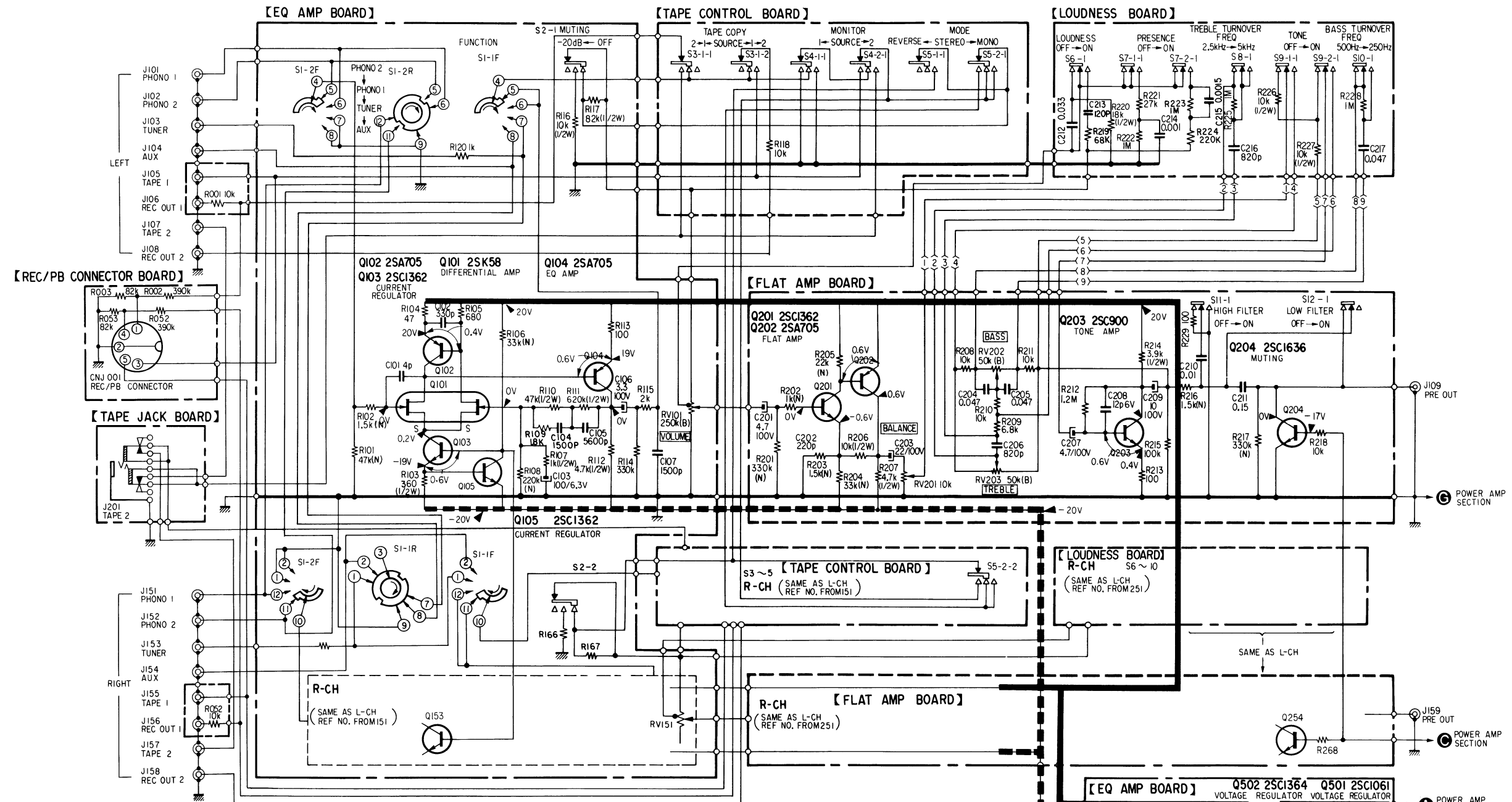
DC BIAS ADJUSTMENT







4-2. SCHEMATIC DIAGRAM – PREAMPLIFIER SECTION –



Note:

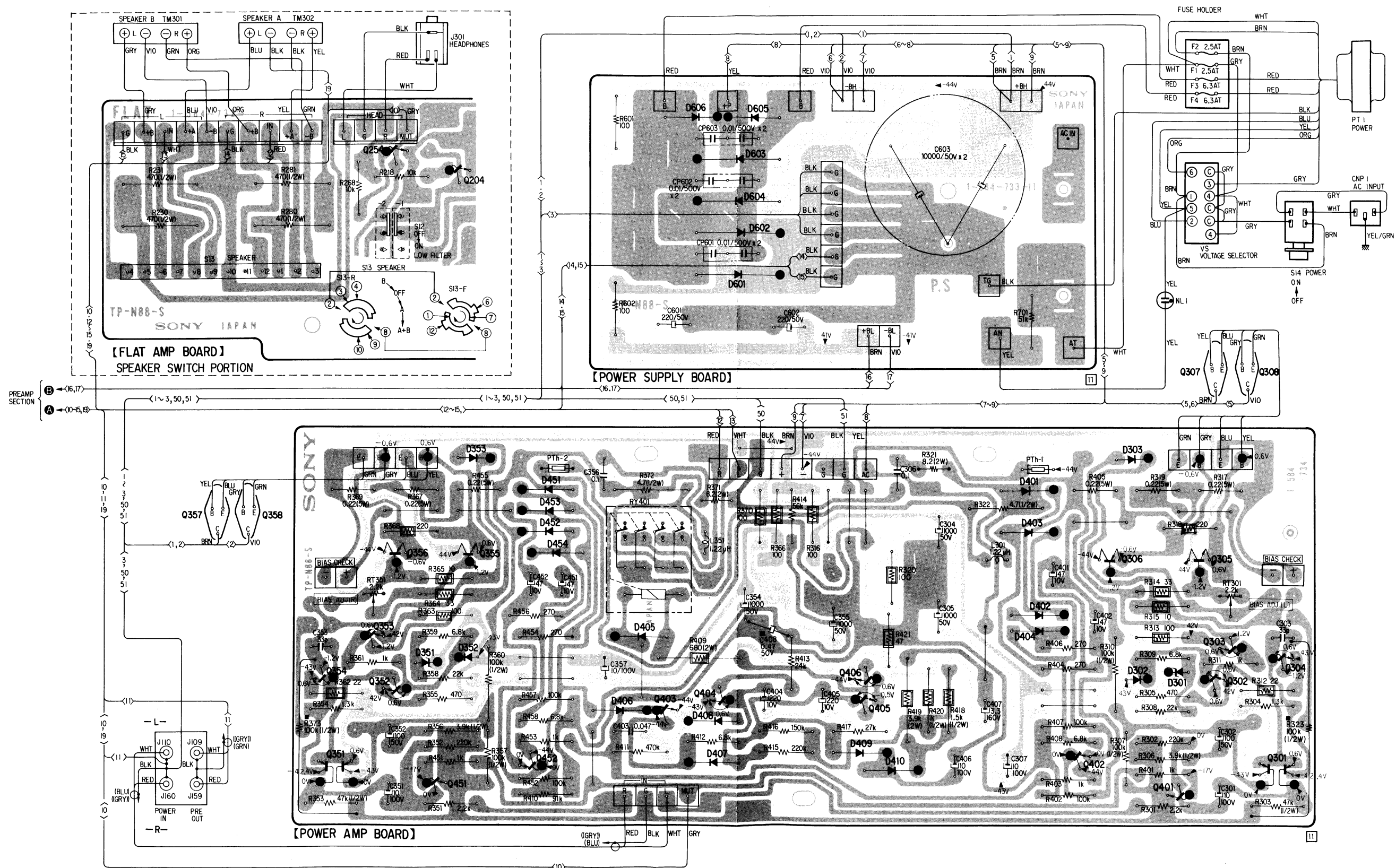
- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
- --- indicates chassis ground.
- (N) indicates a low-noise resistor.
- --- indicates B+ circuit.
- --- indicates B- circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20 $k\Omega/V$).
- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5V range.

• Switch Mode:

Ref. No.	Switch	Position
S 1	FUNCTION	PHONO 2
S 2	MUTING	OFF
S 3	TAPE COPY	SOURCE
S 4	MONITOR	SOURCE
S 5	MODE	STEREO
S 6	LOUDNESS	OFF
S 7	PRESENCE	OFF
S 8	TREBLE TURNOVER FREQ	2.5 kHz
S 9	TONE	OFF
S10	BASS TURNOVER FREQ	500 Hz
S11	HIGH FILTER	OFF
S12	LOW FILTER	OFF

4.3. MOUNTING DIAGRAM – POWER AMPLIFIER SECTION –

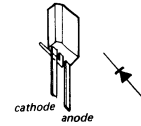
– Conductor Side –



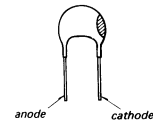
Q	357	358	354	351	353	356 352	451	355	452	403	404	406 405	402	306	401	305	307 302	303	308	301	304		
D							351	353 352	451 452 453 454	406	405	606 407	408 601~604	605	409	410		401 403	402 404			303 302	301

4-4. SCHEMATIC DIAGRAM — POWER AMPLIFIER SECTION —

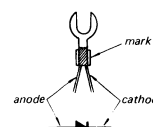
D301
D351 : 1T243



D302
D352 : VD1221



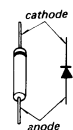
D303
D353 : SV04F



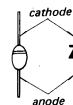
D401,402 : 1T22A

D403~405 : 1S1555

D605,606 : 10E2

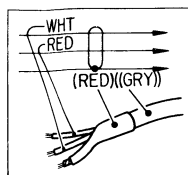


D601~604 : U05E

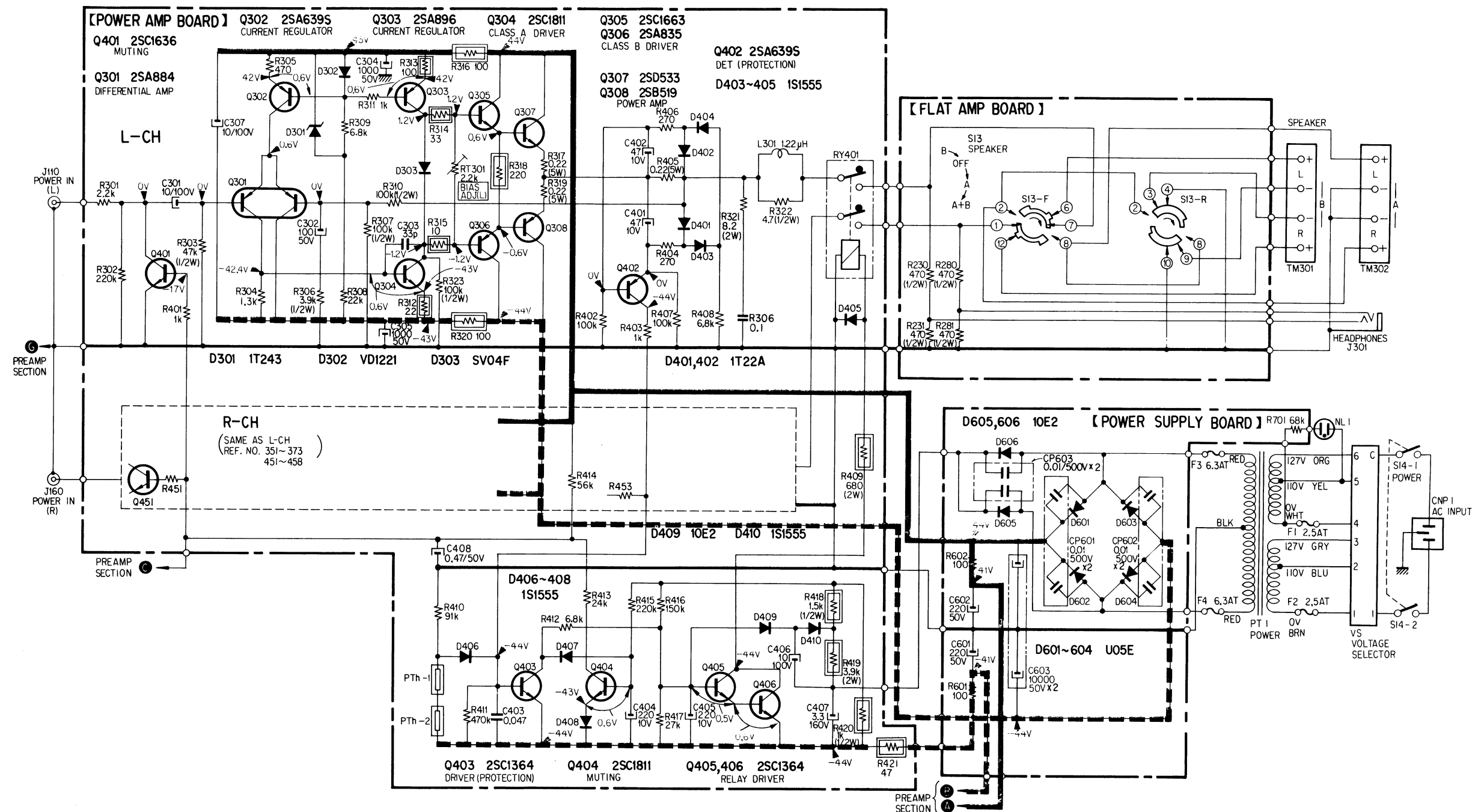


Note:

- indicates parts on the conductor side.
- indicates lead wire connection on the conductor side.
- indicates lead wire connection through the component side.



- B+ pattern
- B- pattern



Note:

- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
- indicates chassis ground.
- (N) indicates a low-noise resistor.
- indicates B+ circuit.
- indicates B- circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20 $k\Omega/V$).

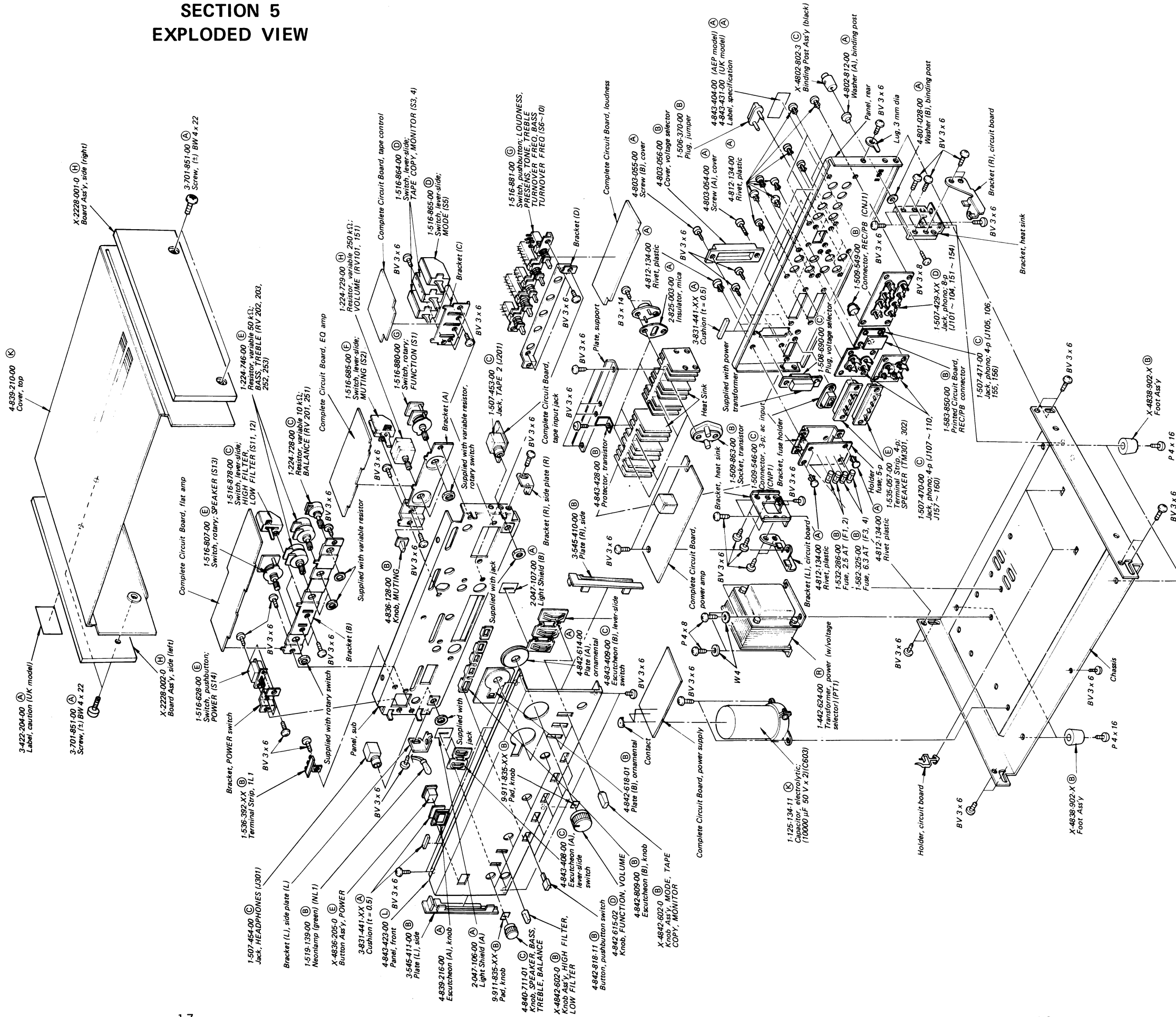
- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5V range.

Switch Mode:

Ref. No.	Switch	Position
S13	SPEAKER	B
S14	POWER	OFF

SECTION 5

EXPLODED VIEW



Note: The mark of \mathbb{A} to \mathbb{Z} : for European model.

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head
- (□□T) shows the number of coils in spring.

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>		
C208(258)	1-102-949-11	(A) 12p		ceramic
C209(259)	1-121-126-11	(A) 10	100V	
C210(260)	1-108-837-12	(A) 0.01		mylar
C211(261)	1-108-851-12	(A) 0.15		mylar
C212(262)	1-108-843-12	(A) 0.033		mylar
C213(263)	1-102-816-11	(A) 120p		ceramic
C214(264)	1-108-825-12	(A) 0.001		mylar
C215(265)	1-108-827-12	(A) 0.0015		mylar
C216(266)	1-103-773-11	(A) 820p		polystyrol
C217(267)	1-108-845-12	(A) 0.047		mylar
G301(351)	1-121-126-11	(A) 10	100V	
C302(352)	1-131-295-11	(C) 100	6.3V	tantalum
C303(353)	1-102-963-11	(A) 33p		ceramic
C304(354) C305(355)	1-123-061-11	(C) 1000	50V	
C306(356)	1-108-849-12	(A) 0.1		mylar
C307(357)	1-123-080-11	(B) 10	100V	
C401(451) C402(452)	1-121-352-11	(A) 47	10V	
C403	1-108-845-12	(A) 0.047		mylar
C404,405	1-123-072-11	(B) 220	10V	
C406	1-123-080-11	(B) 10	100V	
C407	1-123-109-11	(B) 3.3	160V	
C501,502	1-121-148-11	(A) 1	100V	
C503	1-121-421-11	(B) 220	16V	
C504	1-121-148-11	(A) 1	100V	
C505	1-121-421-11	(B) 220	16V	
C601,602	1-121-937-11	(B) 220	50V	
C603	1-125-134-11	(K) 10000+10000	50V	

RESISTORS

All resistors are in Ω . $\frac{1}{4}W$, $\pm 5\%$, carbon resistors (except special type) are omitted. Check schematic diagram for the resistance values. (k = 1,000, M = 1,000 k)

R101(151)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon
R103(153)	1-244-862-11	(A) 360	$\frac{1}{2}W$	carbon
R107(157)	1-244-873-11	(A) 1 k	$\frac{1}{2}W$	carbon
R110(160)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon

R111(161)	1-244-940-11	(A) 620 k	$\frac{1}{2}W$	carbon
R112(162)	1-244-889-11	(A) 4.7 k	$\frac{1}{2}W$	carbon
R116(166)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R117(167)	1-244-919-11	(A) 82 k	$\frac{1}{2}W$	carbon
R206(256)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R207(257)	1-244-889-11	(A) 4.7 k	$\frac{1}{2}W$	carbon
R214(264)	1-244-887-11	(A) 3.9 k	$\frac{1}{2}W$	carbon
R220(270)	1-244-903-11	(A) 18 k	$\frac{1}{2}W$	carbon
R226(276) R227(277)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R230(280) R231(281)	1-244-865-11	(A) 470	$\frac{1}{2}W$	carbon
R303(353)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon
R306(356)	1-244-887-11	(A) 3.9 k	$\frac{1}{2}W$	carbon
R307(357) R310(360)	1-244-921-11	(A) 100 k	$\frac{1}{2}W$	carbon
R312(362)	1-211-506-11	(A) 22	$\frac{1}{4}W$	nonflammable
R313(363)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R314(364)	1-211-510-11	(A) 33	$\frac{1}{4}W$	nonflammable
R315(365)	1-211-498-11	(A) 10	$\frac{1}{4}W$	nonflammable
R316(366)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R317(367)	1-217-156-11	(A) 0.22	5W	wire-wound
R318(368)	1-211-530-11	(A) 220	$\frac{1}{4}W$	nonflammable
R319(369)	1-217-156-11	(A) 0.22	5W	wire-wound
R320(370)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R321(371)	1-258-223-11	(A) 8.2	2W	carbon
R322(372)	1-244-817-11	(A) 4.7	$\frac{1}{2}W$	carbon
R323(373)	1-244-921-11	(A) 100 k	$\frac{1}{2}W$	carbon
R405(455)	1-217-156-11	(A) 0.22	5W	wire-wound
R409	1-206-660-11	(A) 680	2W	metal oxide
R418	1-211-642-11	(A) 1.5 k	$\frac{1}{2}W$	nonflammable
R419	1-206-678-11	(A) 3.9 k	2W	metal oxide
R420	1-211-638-11	(A) 1 k	$\frac{1}{2}W$	nonflammable
R421	1-211-514-11	(A) 47	$\frac{1}{4}W$	nonflammable
R501	1-244-901-11	(A) 15 k	$\frac{1}{2}W$	carbon
R502	1-244-910-11	(A) 36 k	$\frac{1}{2}W$	carbon
R503	1-244-901-11	(A) 15 k	$\frac{1}{2}W$	carbon
RT301(351)	1-224-250-XX	(C) 2.2 k		adjustable
RV101(151)	1-224-729-00	(H) 250 k		variable; VOLUME

• The mark of (A) to (Z) : for European model.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RV201(251)	1-224-728-00	Ⓒ 10 k, variable; BALANCE
RV202(252)	1-224-746-00	Ⓔ 50 k, variable; BASS, TREBLE
RV203(253)		

SWITCHES

S1	1-516-880-00	Ⓖ Rotary, FUNCTION
S2	1-516-685-00	Ⓕ Lever-slide, MUTING
S3,4	1-516-864-00	Ⓓ Lever-slide, TAPE COPY, MONITOR
S5	1-516-865-00	Ⓓ Lever-slide, MODE
S6~10	1-516-881-00	Ⓖ Pushbutton, LOUDNESS, PRESENCE, TONE, TURNOVER FREQ (BASS, TREBLE)
S11,12	1-516-878-00	Ⓒ Lever-slide, HIGH FILTER, LOW FILTER
S13	1-516-807-00	Ⓔ Rotary, SPEAKER
S14	1-516-628-00	Ⓔ Pushbutton, POWER

JACKS

J101~104 (J151~154)	1-507-429-XX	Ⓓ Phono, 8-P
J105,106 (J155,156)	1-507-471-00	Ⓒ Phono, 4-P
J107~110 (J157~160)	1-507-470-00	Ⓒ Phono, 4-P
J201	1-507-453-00	Ⓒ TAPE 2
J301	1-507-454-00	Ⓒ HEADPHONES

• The mark of Ⓐ to Ⓔ : for European model.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
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MISCELLANEOUS

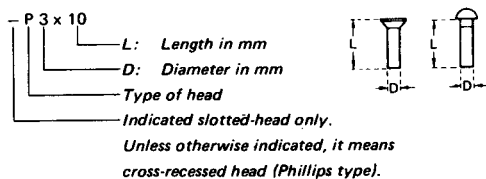
CNJ1	1-509-549-00	Ⓑ Connector, REC/PB
CNP1	1-509-546-00	Ⓒ Connector, 3-P; ac input
CP601~603	1-102-355-11	Ⓑ Encapsulated Component
F1,2	1-532-286-00	Ⓑ Fuse, 2.5AT
F3,4	1-532-325-00	Ⓑ Fuse, 6.3AT
NL1	1-519-139-00	Ⓑ Neon lamp (green)
RY401	1-515-257-00	Ⓗ Relay
TM301,302	1-535-057-00	Ⓔ Terminal Strip, 4-P; SPEAKER
	1-506-370-00	Ⓑ Plug, jumper
	1-508-690-00	Ⓒ Plug, voltage selector
	1-509-863-00	Ⓑ Socket, transistor
	1-536-392-XX	Ⓑ Terminal Strip, 1L1

ACCESSORIES

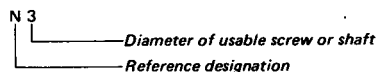
1-506-113-00	Ⓑ Plug, shorting
1-534-819-00	Ⓖ Cord, power
3-780-852-11	Ⓑ Manual, instruction

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

Sony Corporation

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